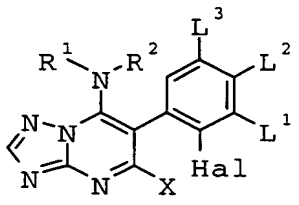
Claims

1. Substituted 6-(2-halogenphenyl)-triazolopyrimidines of formula I



I

in which

Hal is halogen;

L^1, L^3 independently denote hydrogen, halogen, or C_1-C_4-alkyl;

L^2 is hydrogen, halogen, C_1-C_4-haloalkyl, or NH_2, NHR^b, or $N(R^b)_2$,

R^b is C_1-C_8-alkyl, C_3-C_{10}-alkenyl, C_3-C_{10}-alkynyl, C_1-C_6-haloalkyl, C_3-C_6-haloalkenyl, C_3-C_6-haloalkynyl, C_1-C_8-alkoxy-C_1-C_8-alkyl, C_1-C_8-alkylthio-C_1-C_8-alkyl, C_3-C_{10}-cycloalkyl, or C(=O)-A, in which

A is hydrogen, hydroxy, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_6-halogenalkoxy, C_1-C_8-alkylamino or di-(C_1-C_8-alkyl)amino;

wherein at least one from L^1, L^2, and L^3 is not hydrogen;

X is halogen, cyano, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy or C_3-C_8-alkenyloxy.

R^1 denote C_1-C_{10}-alkyl, C_2-C_{10}-alkenyl, C_2-C_{10}-alkynyl, or C_4-C_{10}-alkadienyl, C_2-C_{10}-haloalkenyl

wherein R^1 may be unsubstituted or may carry one to three groups R^a,

R^a is cyano, nitro, hydroxyl, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, C_2-C_6-alkynyl, C_3-C_6-alkynyloxy, or C_1-C_4-alkylenedioxy;

R^2 is hydrogen;

2. Compounds of formula I according to claim 1, in which

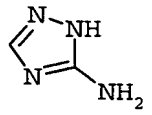
R^1 is straight chained or branched C_2-C_6-alkenyl, C_1-C_6-alkyl.

3. Compounds of formula I according to claim 1 or 2 in which X is halogen.

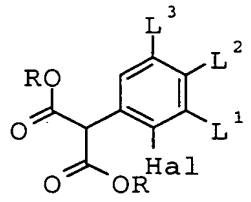
4. Compounds of formula I according to any one of claims 1 to 3 in which the 6-(2-halogenphenyl)group represents one of the following moieties:

2,3,5-trifluorophenyl, 2-F,4-CF_3-phenyl, 2-F,5-CH_3-phenyl, 2-Cl,4-F-phenyl, 2-F,4-Cl-phenyl, 2-F,4-Br-phenyl, 2-Cl,4-Br-phenyl, 2,3-difluorophenyl, 2,4-difluorophenyl, 2,4,5-trifluorophenyl, 2,3,4-trifluorophenyl, 2-F,4-NHC(O)CH_3-phenyl, 2-Br,3,5-difluorophenyl, 2-F,4-NO_2-phenyl, and 2-Cl,4-NO_2-phenyl.

5. A process for the preparation of compounds of formula I as defined in claims 3 and 4 which comprises reacting 5-amino-1,2,4-triazole

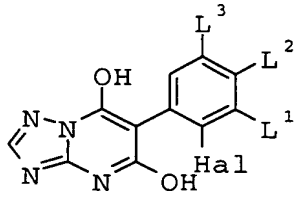


with 2-phenyl-substituted malonic acid ester of formula II,



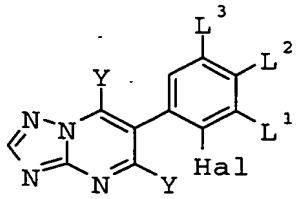
II

wherein Hal, L^1, L^2, and L^3 are as defined in formula I, and R denotes C_1-C_6-alkyl, under alkaline conditions, to yield compounds of formula III,



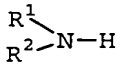
III

which are subsequently treated with a halogenating agent to give 5,7-dihalogen-6-phenyl-triazolopyrimidines of formula IV



IV

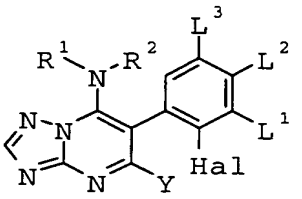
in which Y is halogen, and which is reacted with an amine of formula V



V

in which R^1 and R^2 are as defined in claim 1 to produce compounds of formula I, as defined in claim 1.

6. A process for the preparation of compounds of formula I according to claim 1 wherein X is cyano, C_1-C_{10}-alkoxy, or C_1-C_6-haloalkoxy, which comprises reacting 5-halogen-triazolopyrimidine of formula I',



I'

wherein Y is halogen, with compounds of formula VI,

M-X' VI

which are, dependent from the value of X' to be introduced, an anorganic cyano salt, an alkoxylate, haloalkoxylate or an alkenyloxylate, resp., wherein M is ammonium-, tetraalkylammonium-, alkalimetal- or earth metal cation, to produce compounds of formula I.

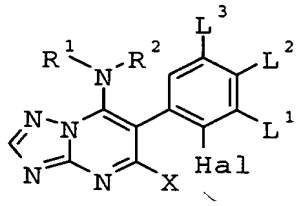
7. Intermediates of formulae II, III, and IV as defined in claim 5,in which the 6-(2-halogenphenyl)group represents one of the following moieties:

2,3,5-trifluorophenyl, 2-F,4-CF_3-phenyl, 2-F,5-CH_3-phenyl, 2-Cl,4-F-phenyl, 2-F,4-Cl-phenyl, 2-F,4-Br-phenyl, 2-Cl,4-Br-phenyl, 2,3-difluorophenyl, 2,4,5-trifluorophenyl, 2,3,4-trifluorophenyl, 2-F,4-NHC(O)CH_3-phenyl, 2-Br,3,5-difluorophenyl, 2-F,4-NO_2-phenyl, and 2-Cl,4-NO_2-phenyl.

8. A composition suitable for controlling phytopathogenic fungi, comprising a solid or liquid carrier and a compound of the formula I as claimed in claim 1.

9. A method for controlling phytopathogenic fungi, which comprises treating the fungi or the materials, plants, the soil or the seed to be protected against fungal attack with an effective amount of a compound of the formula I as claimed in claim 1.

10. Substituted 6-(2-halogenphenyl)-triazolopyrimidines of formula I



I

in which

Hal is halogen;

L^1, L^3 independently denote hydrogen, halogen, or C_1-C_4-alkyl;

L^2 is hydrogen, halogen, C_1-C_4-haloalkyl, or NH_2, NHR^b, or $N(R^b)_2$,

R^b is C_1-C_8-alkyl, C_3-C_{10}-alkenyl, C_3-C_{10}-alkynyl, C_1-C_6-haloalkyl, C_3-C_6-haloalkenyl, C_3-C_6-haloalkynyl, C_1-C_8-alkoxy-C_1-C_8-alkyl, C_1-C_8-alkylthio-C_1-C_8-alkyl, C_3-C_{10}-cycloalkyl, or C(=O)-A, in which

A is hydrogen, hydroxy, C_1-C_8-alkyl, C_1-C_8-alkoxy, C_1-C_6-halogenalkoxy, C_1-C_8-alkylamino or di-(C_1-C_8-alkyl)amino;

wherein at least one from L^1, L^2, and L^3 is not hydrogen;

X is halogen, cyano, C_1-C_6-alkyl, C_1-C_6-alkoxy, C_1-C_6-haloalkoxy or C_3-C_8-alkenyloxy.

R^1 and R^2 together with the interjacent nitrogen atom represent a saturated or partially unsaturated 5- or 6-membered heterocycle, containing one to four nitrogen atoms or one to three nitrogen atoms and one sulfur or

oxygen atom, which ring may be substituted by one to three R^a radicals;

R^a is cyano, nitro, hydroxyl, C_1-C_6-alkyl, C_3-C_6-cycloalkyl, C_1-C_6-alkoxy, C_1-C_6-alkylthio, C_1-C_6-alkylamino, di-C_1-C_6-alkylamino, C_2-C_6-alkenyl, C_2-C_6-alkenyloxy, C_2-C_6-alkynyl, C_3-C_6-alkynyloxy, or C_1-C_4-alkylenedioxy;

11. Compounds of formula I according to claim 10, in which

R^1 and R^2 together with the interjacent nitrogen atom represent a heterocyclic ring with 5 or 6 carbon atoms being optionally substituted with one or two C_1-C_4-alkyl groups.

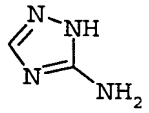
12. Compounds of formula I according to claim 10 or 11 in which R^1 and R^2 together with the interjacent nitrogen atom represent a 5- or 6-membered heterocyclic ring being optionally substituted with one or two methyl groups.

13. Compounds of formula I according to any one of claims 10 to 12 in which X is halogen.

14. Compounds of formula I according to any one of claims 10 to 13 in which the 6-(2-halogenphenyl)group represents one of the following moieties:

2,3,5-trifluorophenyl, 2-F,4-CF_3-phenyl, 2-F,5-CH_3-phenyl, 2-Cl,4-F-phenyl, 2-F,4-Cl-phenyl, 2-F,4-Br-phenyl, 2-Cl,4-Br-phenyl, 2,3-difluorophenyl, 2,4-difluorophenyl, 2,4,5-trifluorophenyl, 2,3,4-trifluorophenyl, 2-F,4-NHC(O)CH_3-phenyl, 2-Br,3,5-difluorophenyl, 2-F,4-NO_2-phenyl, and 2-Cl,4-NO_2-phenyl.

15. A process for the preparation of compounds of formula I as defined in claims 13 and 14 which comprises reacting 5-amino-1,2,4-triazole



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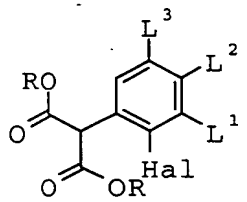

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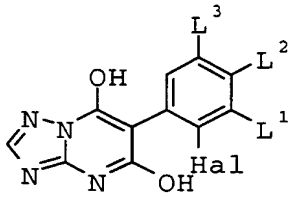
wherein Hal, L^1, L^2, and L^3 are as defined in formula I, and R denotes C_1-C_6-alkyl, under alkaline conditions, to yield compounds of formula III,



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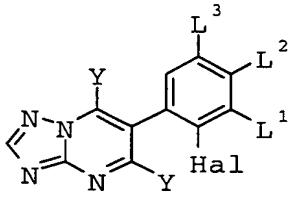
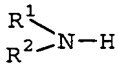
which are subsequently treated with a halogenating agent to give 5,7-dihalogen-6-phenyl-triazolopyrimidines of formula IV



IV

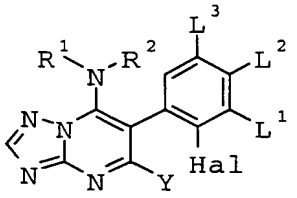
in which Y is halogen, and which is reacted with an amine of formula V



V

in which R^1 and R^2 are as defined in claim 10 to produce compounds of formula I, as defined in claim 10.

16. A process for the preparation of compounds of formula I according to claim 10 wherein X is cyano, C_1-C_{10}-alkoxy, or C_1-C_6-haloalkoxy, which comprises reacting 5-halogen-triazolopyrimidine of formula I',



I'

wherein Y is halogen, with compounds of formula VI,

M-X' VI

which are, dependent from the value of X' to be introduced, an anorganic cyano salt, an alkoxylate, haloalkoxylate or an alkenyloxylate, resp., wherein M is ammonium-, tetraalkylammonium-, alkalimetal- or earth metal cation, to produce compounds of formula I.

17. A composition suitable for controlling phytopathogenic fungi, comprising a solid or liquid carrier and a compound of the formula I as claimed in claim 10.

18. A method for controlling phytopathogenic fungi, which comprises treating the fungi or the materials, plants, the soil or the seed to be protected against fungal attack with an effective amount of a compound of the formula I as claimed in claim 10.